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EXAMINER

KIM, ALEXANDER D

ART UNIT

PAPER NUMBER

1656

NOTIFICATION DATE

DELIVERY MODE

03/17/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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DETAILED ACTION

Application Status

1. In response to the previous Office action, a non-Final rejection (mailed on 04/28/2009), Applicants filed a response and amendment received on 07/22/2009. Said amendment has cancelled Claims 2, 7-8 and 10-19; amended Claims 1, 3 and 5.

Claims 1, 3-6 and 9 are pending in the instant Office action and examined herein.

Withdrawn-Compliance with Sequence Rules

2. The previous objection for non-compliance with the Sequence Rules because Figure 5 discloses one nucleic acid sequence and three polypeptide sequences without appropriate SEQ ID NOs, is withdrawn by virtue of applicants' amendment in the description of Figure 5, see page 2 of specification filed on 7/22/2009.

Withdrawn-Objections to the Specification

3. The previous objection to the specification because the abstract of the disclosure contains multiple paragraphs, wherein it should be one paragraph, is withdrawn by virtue of applicants' newly filed abstract (see page 3 of specification filed on 7/22/2009).

Withdrawn-Claim Objections

4. The previous objection of Claim 1 (Claims 2-6, 9 and 15 dependent therefrom) for reciting "PHA" without first reciting the entire phrase for which the abbreviation is used is withdrawn by virtue of applicants' amendment.

5. The previous objection of Claim 5 for reciting "molecular weight of the copolymer" without a unit, is withdrawn by virtue of applicants' amendment.

6. The previous objection of Claim 15 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim, is withdrawn by virtue of canceling claim 15.

New-Claim Objections

7. Claims 1, 3-6 and 9 are objected to because of the following informalities:

a. Claim 1 (Claims 3-6 and 9 dependent therefrom) recites "KCTC 040-6 BP". It should be ---KCTC 0406BP--- according to the deposit receipt provided by the applicants on 7/22/2009.

b. Claim 1 (Claims 3-6 and 9 dependent therefrom) recites step of "subjected the permanently". It should be --- subjecting the permanently ...--- to improve format of claim. 11.

c. Claim 1 (Claims 3-6 and 9 dependent therefrom) recites "prepared by the method comprising" and because additional unrecited steps are encompassed by the claim, *i.e.*, the claim is not necessarily limited to the recited steps, it is suggested that the noted phrase be amended to recite, *e.g.*, "prepared by a method".

d. Claim 1 (Claims 3-6 and 9 dependent therefrom) recites “a *Pseudomonas* sp. HJ-2 strain (Accession No. KCTC 040-6 BP)” and since the strain is limited to Accession No. KCTC 040-6 BP, in order to substantially improve claim form, it is suggested that the noted phrase be amended to recite, *e.g.*, “the *Pseudomonas* sp. HJ-2 strain deposited as Accession No. KCTC 040-6 BP”.

e. Claim 9 is objected to in the recitation of “culturing...with supply of heptanoic acid” and in order to improve claim form, it is suggested that the noted phrase be amended to recite, *e.g.*, “culturing...with heptanoic acid”

Withdrawn-Claim Rejections - 35 USC § 112

8. The previous rejection of Claims 1-6, 9 and 15 under of 35 U.S.C. 112, second paragraph, because Claim 1 (Claims 2-6, 9 and 15 dependent therefrom) provides for the use of microorganisms, wherein the claim does not set forth any steps involved in the method/process; thus, it was unclear what method/process applicant is intending to encompass, is withdrawn by virtue of applicants' amendment to claim 1 to set forth steps involved in the claimed method and cancellation of claim 15.

9. The previous rejection of Claim 1-6, 9 and 15 under 35 U.S.C. 112, first paragraph, **enabling deposit**, as failing to comply with the enablement requirement, is withdrawn by virtue of applicants' argument on page 10, Remarks filed on 7/22/2009.

Withdrawn-Claim Rejections - 35 USC § 101

10. The previous rejection of Claims 1-6, 9 and 15 under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101, is withdrawn by virtue of applicants' amendment in claim 1.

Withdrawn-Claim Rejections - 35 USC § 102

11. The previous rejection of Claim 2 under 35 U.S.C. 102(b) as being anticipated by Kim et al. (Korean Patent 10-1999-0080695, Published 15 Nov. 1999, as cited in the IDS), is withdrawn by virtue of canceling claim 2.

Maintained-Claim Rejections - 35 USC § 102

12. Claims 1, 3-6 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim et al. (Korean Patent 10-1999-0080695, Published 15 Nov. 1999, as cited in the IDS filed on 9/21/06).

The rejection was stated in the previous office action as it applied to previous Claims 1-6 and 9. In response to this rejection, applicants have cancelled Claim 2; amended Claims 1, 3 and 5; and traverse the rejection as it applies to the newly amended claims.

Applicants argue that instant application is directed to a method for preparing the PHA block copolymer having orientation-induced rubber-elasticity and temperature-

sensitive shape memory effects, which were surprisingly discovered by the inventors (see page 12, top, Remarks filed on 7/22/2009). Applicants argue the prior art by Kim et al. do not teach method steps (c) and (d); wherein Kim et al. teach a preparation of film which cannot provide the temperature-sensitive shape memory effects (see bottom of page 12, Remarks filed on 7/22/2009). Applicants also argue the Examiner has incorrectly compared "rubber elasticity" with "shape memory effect" because instant invention requires shape memory effect having property of not recovering even after an applied stretching force is released from a stretched shape. Thus, applicants summarized that Kim et al. failed to teach a process of preparing a copolymer having orientation-induced rubber-elasticity and temperature -sensitive shape memory effects as claimed (see top of page 12, Remarks filed on 7/22/2009).

Applicants' arguments have been fully considered but are not deemed persuasive for the following reasons. Applicants' argument is based on the characteristics of polymer prepared by Kim et al. at different time and/or condition; and argument is based on the characteristics which are at different stages to show the differences from the claimed invention. However, as applicants have acknowledged the rubber band prepared by Kim et al. has all the characteristics described in the instant claims wherein the Kim et al. teach a method which meets all limitation of claimed invention as noted in the previous office action. The rubber band prepared by the method of Kim et al. has a temporary shape [as described in claim 1(d)] such as stretching at near room temperature. The rubber band prepared by the method of Kim et al. also has a permanently deformed shape [as described in claim 1(c)] at room

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temperature which is formed by heating, molding and cooling it to room temperature using PHA as a starting material.

It is noted an English-language translation of Kim et al. has been made of record by the Examiner on 3/30/2009.

Claims 1, 3-6 and 9 are drawn to a method for preparing a PHA block copolymer comprises a plurality of 3HB and a plurality of 3HV by biosynthesis using microorganisms *Pseudomonas* sp. HJ-2 strain deposited as KCTC 0406 BP as disclosed in claims 1, 3-6 and 9.

Kim et al. teach a method of preparing a PHA block copolymer comprising 5-100% of a plurality of 3HB (Formula 1), 0-95% a plurality of 3HV (Formula 2) and 0-80% a plurality of copolymer Formula 3 (see chemicals in the middle of page 4; and line 15 for the recitation of %). Kim et al. teach a method of preparing Poly-3-hydroxyalkanoate (PHA) block copolymer having rubber-elasticity (which is biodegradable elastic material, see Abstract and the Title) by culturing the "*Pseudomonas* sp. HJ-2 strain deposited as KCTC 0406 BP" (see page 4, lines 11-12 or Abstract; and the example on page 8) using saturated and unsaturated carboxylic acid as carbon source of PHA polymer as shown in reaction scheme 2 in bottom of page 3; meeting the limitation of claim 1(a). Kim et al. teach the harvested cell is crushed by grinding in the presence of sea sand (see page 9, bottom) to extract PHA; meeting the limitation of claim 1(b). Kim et al. teach the produced PHA block copolymer can be pressed with 10 to 50 tons after heating to about 150 °C to make permanently shaped polymer such as a film from the polymer material that is produced initially and/or rubber like material by melting it, for example, (see page

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7, lines 37-38), meeting the limitation of claim 1(c). Kim et al. teach the produced PHA block copolymer would be used to make rubber band, for example, (see page 7, line 9), which would recover its original state of originally shaped material when it is released from a stretched shape (i.e., temporarily shaped) since its melting point is about 40-60 °C (see bottom of page 2 and bottom of page 3); wherein the rubber band prepared by said PHA copolymer has permanently deformed shape at room temperature and forms temporary shape to a constant external force applied for a predetermined period of time; meeting the limitation of claim 1(d). Thus, the process of Kim et al. teach, once the PHA block copolymer is produced, it can be heated and form any desired shape and form having elastic property (e.g. rubber band) or form a permanently shaped polymer such as film, meeting the limitations in Claims **1, 3-4 and 6**. Since the PHA polymer produced by Kim et al. and the PHA polymer produced by instant invention are produced from the identical microorganism deposited as KCTC 0406BP using an identical process, the PHA polymer of Kim et al. has a molecular weight that falls within the molecular weight range recited in claim **5**. Kim et al. teaches a method of preparing copolymer from heptanoic acid (see Example 3, bottom of page 11); thus, meeting the limitation of heptanoic acid in Claim **9**.

Withdrawn-Claim Rejections - 35 USC § 103

13. The previous rejection of Claim 1, 3-6, 9 and 15 under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (Korean Patent 10-1999-0080695, Published 15 Nov. 1999, as cited in the IDS) in view of Timm et al. (Appl Microbiol Biotechnology, 1994,

Vol. 40, pages 669-675) as evidenced by Daniel et al. (Current Microbiology, E publication June 13, 2005, Vol. 50, pages 329-333), which was directed to the limitations of claim 15, is withdrawn by virtue of cancelling claim 15.

Conclusion

14. Claims 1, 3-6 and 9 are not allowed for the reasons identified in the numbered sections of this Office action. Applicants must respond to the objections/rejections in each of the numbered section in this Office action to be fully responsive in prosecution.

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER D. KIM whose telephone number is (571)272-5266. The examiner can normally be reached on 10AM-6:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Manjunath Rao can be reached on (571) 272-0939. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alexander D Kim/
Examiner, Art Unit 1656

/David J. Steadman/
Primary Examiner, Art Unit 1656